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PDP11/45 HANDOUTS

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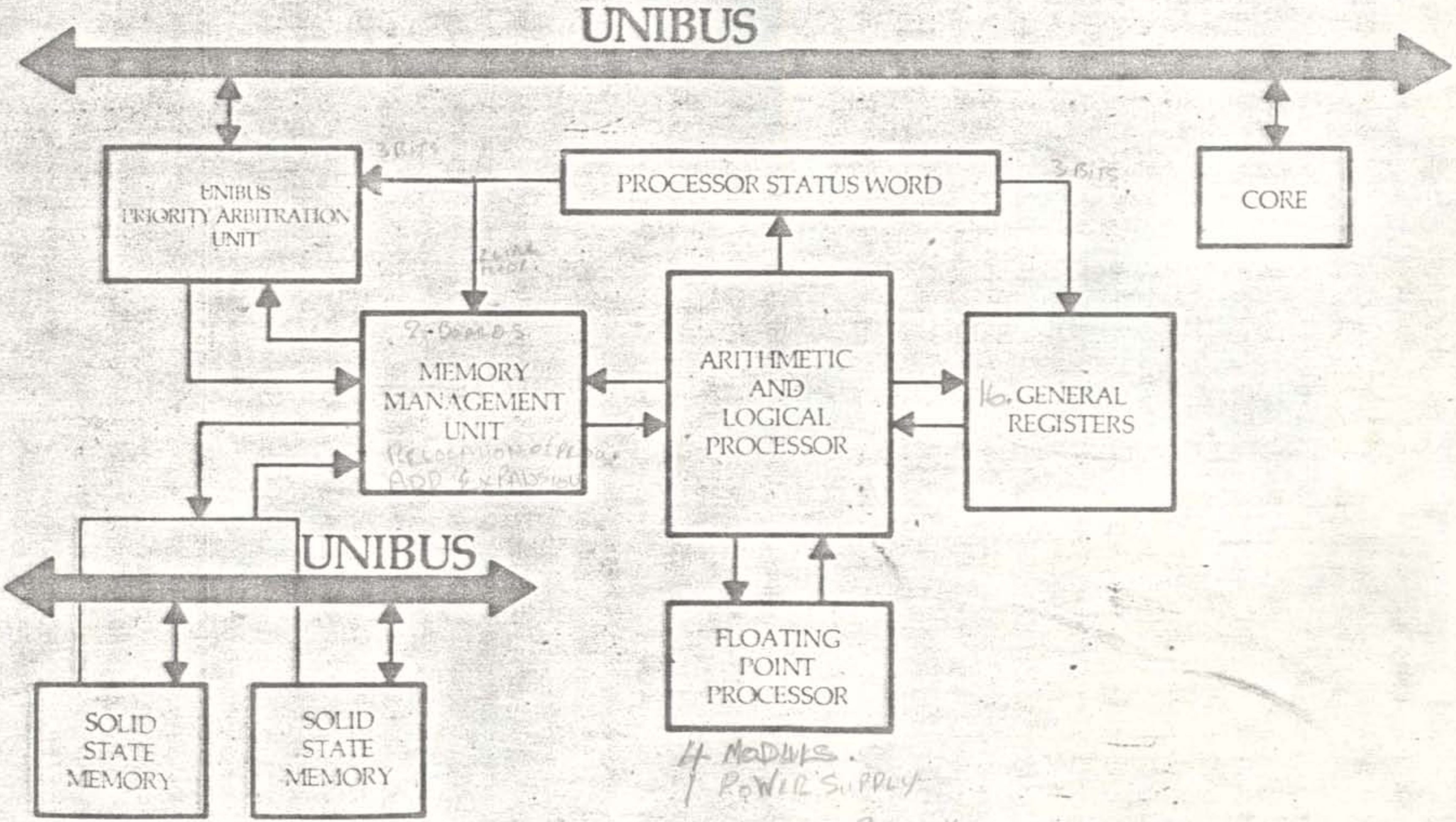
PDP11/45.HANDOUTS

central processor

organization



UNIBUS

UNIBUS PRIORITY ARBITRATION UNIT

3 BITS

PROCESSOR STATUS WORD

3 BITS

CORE

[illegible]

2 BOARDS

MEMORY MANAGEMENT UNIT

RELOCATION OF PROG ADD & EXPANSION

ARITHMETIC AND LOGICAL PROCESSOR

16 GENERAL REGISTERS

UNIBUS

FLOATING POINT PROCESSOR

SOLID STATE MEMORY

SOLID STATE MEMORY

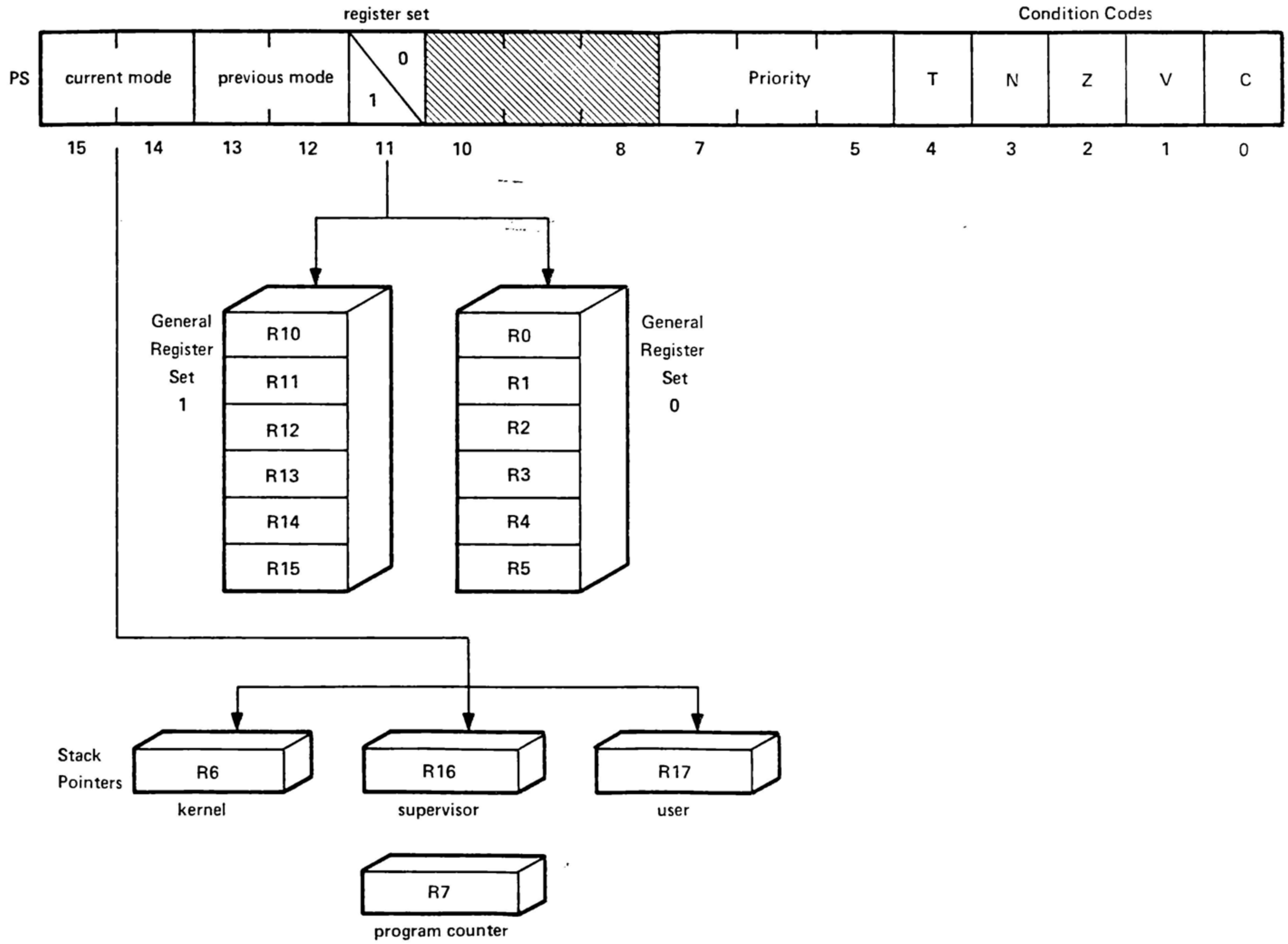
4 MODULES.
1 POWER SUPPLY

CAN JUST REMOVE BOARDS AND RUN M/C.

KB11-A-000-H.0, #002

pdp11/45

PROCESSOR STATUS WORD AND GENERAL REGISTERS



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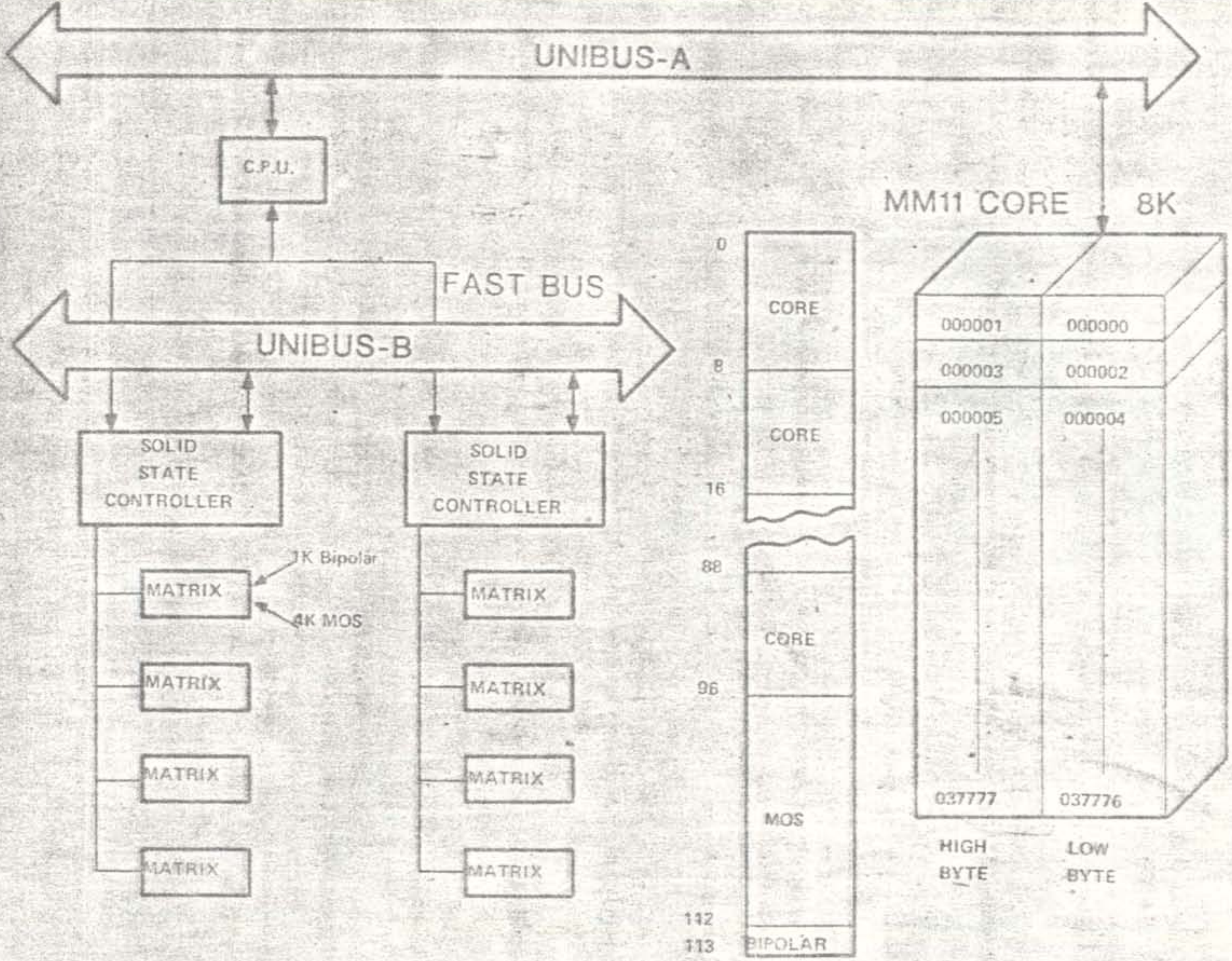
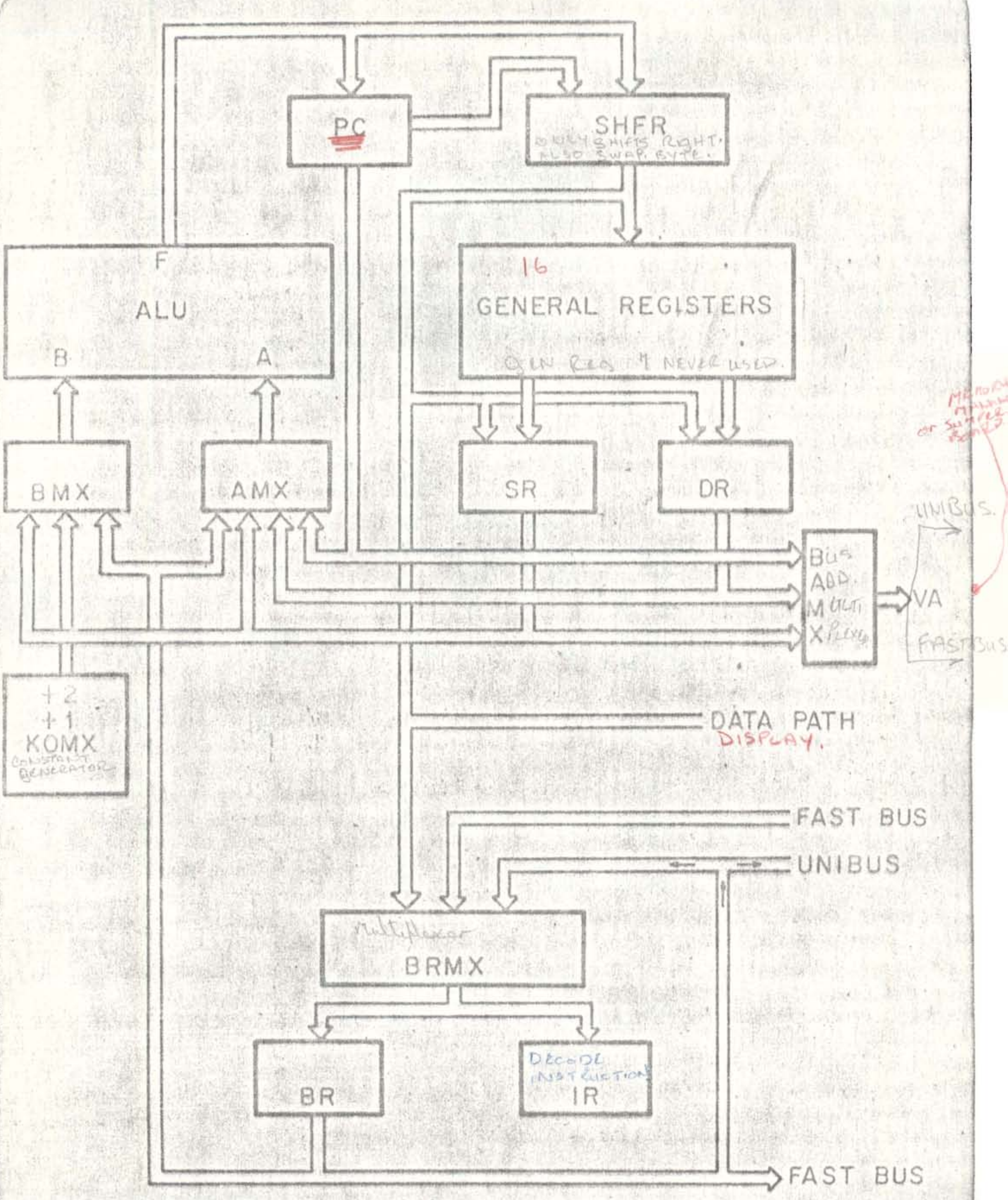
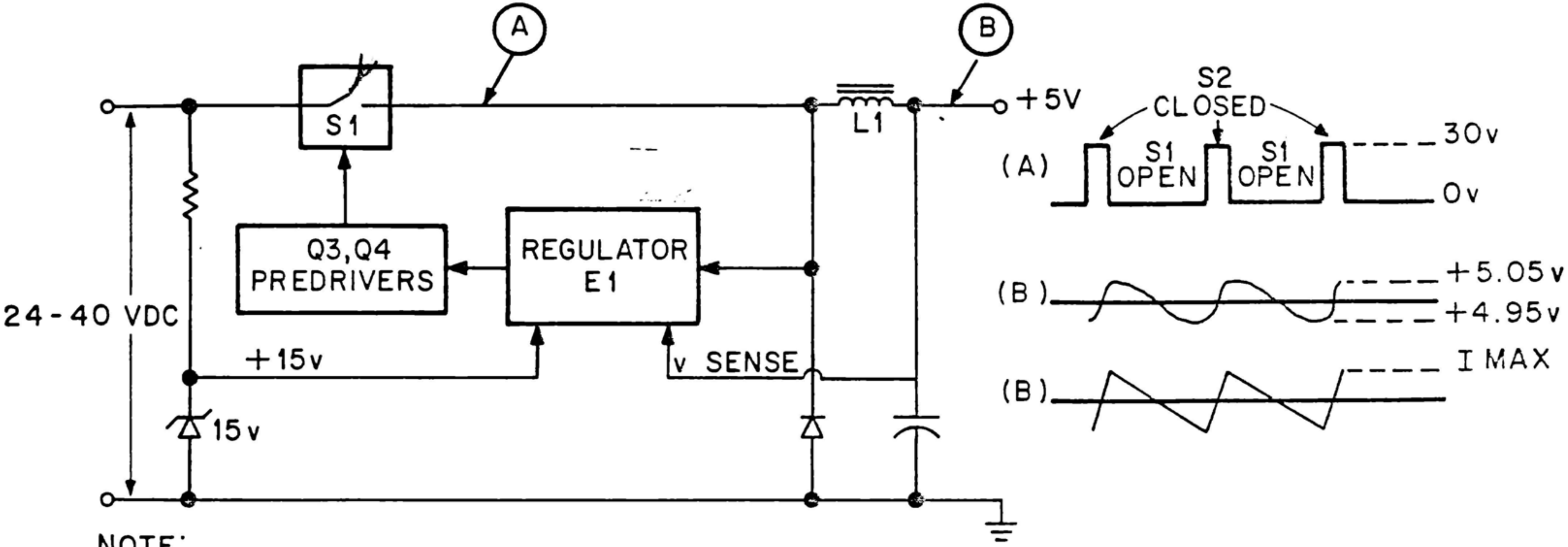
MEMORIES





SIMPLIFIED KB11-A BLOCK DIAGRAM



NOTE:
a. E1 precision voltage
b. S1 pass transistor Q2

SIMPLIFIED VOLTAGE REGULATOR

PDP11/45 SUBSYSTEM CHECKOUT

A. CPU Console

1. The console communicates to the CPU logic via two cables which go to card slot 10 (M8104 and slot 12 (M8106)

2. Power Supplies - refer to pages 5-10 to 5-13 for console power supply information. 11/45-11/50 Maintenance Manual

3. The console can be used to perform the following CPU checks:

    a. General Register

    b. Memory cycles

        (1) Branch Self

        (2) DATI and DATO to Memory

        (3) DATI and DATO to TTY

    c. Verify Unibus AClo and DC lo problems → ROM HANGS UP AT ADDRESS 200.

    d. Lamp Test

PDP11/45 SUBSYSTEM CHECKOUT

B. Central Processor KB11-A

1. Card slots 6,7,8,9,10,11,12, and 15

   a. M8100 slot 6
   b. M8101 slot 7
   c. M8102 slot 8
   d. M8103 slot 9
   e. M8104 slot 10 *
   f. M8105 slot 11
   g. M8106 slot 12 *
   h. M8109 slot 15

   * CAUTION: These 2 modules also have cables connected to the console. Remove the cables first before removing the module.

2. Major functions of each CPU module

   a. M8100 - slot 6 - ALU Control
   b. M8101 - slot 7 - General register, ALU Control
   c. M8102 - slot 8 - Condition codes, Instruction decoding
   d. M8103 - slot 9 - ROM Control
   e. M8104 - slot 10 - Processor data and Unibus Registers
   f. M8105 - slot 11 - Priority arbitration and MSC Control
   g. M8106 - slot 12 - UNIBUS and Console Control
   h. M8109 - slot 15 - Timing Generator (clocks)

3. Power Supplies

   a. +5v H744 Regulator in slots B and C

      (1) Check +5v on pins A2, V1 on rows A-F of each module.

   b. +15v from Upper H742 bulk supply goes to slot 15 for the M8109 module.

      (1) Check +15v on pin A1 of row E in slot 15.

NOTES: 1. Detailed power distribution can be found in the PDP11/45 and 11/50 system maintenance manual, pages 73-77 for all subsystems in the PDP11/45 pages 5-10 thru 5-13.

2. Refer also, to table 6-2 on page 6-3 of the 11/45 and 11/50 Manual for a DC voltage checklist.

3. Refer also, to table 5-2, page 5-15 of the 11/45 and 11/50 manual for voltage tolerances.

4. KB11-A CPU Diagnostics

Refer to page 6-8 through 6-9 of the PDP11/45 and 11/50 manual for a list of CPU diagnostics.

a. Try to run the Instruction Exerciser Diagnostic first as it checks all PDP11/45 instructions and address modes (11-DCQKC)

C. Memory Management KT11-C

1. Card Slots 13 and 14
   - a. M8108 slot 13
   - b. M8107 slot 14
2. Power supply is +5v H744 regulator in slot C
   - a. Check +5v in slots 13 and 14 at pins A2 and V1 in rows A-F of each module.
3. KT11-C Diagnostics

   Refer to pages 7-7 through 7-8 of the PDP11/45 and PDP11/50 system maintenance manual.

CAUTION: The KT11-C option cannot be removed without replacing the two modules with the M8116 module into slot 14 of the CPU or by exchanging either KT11-C module with a replacement. The CPU address scheme requires either the KT11-C option in slots 13 and 14, or the system address module in slot 14.

D. Floating Point Processor FP-11

1. Card slots 2,3,4, and 5

    a. M8114 slot 2
    b. M8115 slot 3
    c. M8112 slot 4
    d. M8113 slot 5

2. Power supply is +5v H744 regulator in slot A

    a. Check +5v in slots 2-5 at pins A2 and V1 in rows A-F of each module.

3. FP-11 Diagnostics

    Refer to pages 7-1 through 7-2 of the PDP11/45 and 11/50 system maintenance manual.

NOTE: 1. The FP-11 "can be" removed from the CPU completely without causing ill effects to other areas of the PDP11/45. If this procedure is necessary, remove all four modules.

2. If the FP problem remains after all four modules have been replaced, the problem is most likely in one of the CPU modules or in the FP11 Power Supply.

1.6 SEMICONDUCTOR MEMORY SYSTEM CONFIGURATIONS

Tables 1-1 and 1-2 list the quantity of options that are required as a result of the selected memory type (MOS or bipolar) and size. The module complement that comprises the corresponding option is also shown. If, for example, a 24K capacity MOS memory without parity is desired, the required configuration will consists of one MS11-BC option (composed of one M8110 module, one H746A module, and one H744A module), one MS11-BD option, and six MS11-BM options (G401 memory matrices). The additional M8110 Controller (MS11-BD option) is necessary for the 8K of memory in excess of the 16K controlled by the MS11-BC option.

Table 1-1

MOS Memory System Configuration

Memory Capacity Option		Option Type Number			
		MS11-BC	MS11-BD	MS11-BM	MS11-BP
		Module Complement			
With Parity	Without Parity	(1)M8110 (1)H746A (1)H744A	(1)M8110	(1)G401	(1) G401YA
4K		1			1
	4K	1		1	
8K		1			2
	8K	1		2	
12K		1			3
	12K	1		3	
16K		1			4
	16K	1		4	
20K		1	1		5
	20K	1	1	5	
24K		1	1		6
	24K	1	1	6	
28K		1	1		7
	28K	1	1	7	
32K		1	1		8
	32K	1	1	8	

Table 1-2

Bipolar Memory System Configuration

Memory Capacity Option		Option Type Number		
		MS11-CC	MS11-CM	MS11-CP
		Module Complement		
With Parity	Without Parity	(1)M8110 (2)H744A	(1)M8111	(1)M8111YA
1K		1		1
	1K	1	1	
2K		1		2
	2K	1	2	
3K		1		3
	3K	1	3	

(continued on next page)

Table 1-2 (Cont)

Bipolar Memory System Configuration

Memory Capacity Option		Option Type Number		
		MS11-CC	MS11-CM	MS11-CP
		Module Complement		
With Parity	Without Parity	(1)M8110 (2)H744A	(1)M8111	(1)M8111YA
4K		1		4
	4K	1	4	
5K		2		5
	5K	2	5	
6K		2		6
	6K	2	6	
7K		2		7
	7K	2	7	
8K		2		8
	8K	2	8	

G. Small Peripheral Interface Modules
(Peripheral Controllers)

1. Devices like TTY, LA30, HSR/HSP etc. may have their Unibus Interface Logic installed in CPU card slots 26,27 or 28.

2. Various combinations of interfaces could be used, therefore a specific module allocation for this logic cannot be listed.

NOTE: Anytime a Unibus interface module is removed from a card slot. A bus grant continuity card (G727A) must be inserted into row D of the respective card slot. This continuity card is used to keep the Unibus Bus Grant signals active between interface modules and throughout the Unibus.

3. Power Supplies - Refer to pages 5-10 to 5-13 of the PDP11/45 and 11/50 Maintenance Manual. (Peripheral Controllers)

4. Detailed Information concerning peripheral controllers can be found in the PDP11 Peripherals Handbook.

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